

CLAIMS

1. An assembly comprises a housing (140), an electric motor (130) accommodated within a first portion (142) of the housing, rotating machinery (132) accommodated within a second portion (144) of the housing and driven by the electric motor, separation means (146) in the housing between the first and second portions thereof for separating fluid acted upon by the rotating machinery (132) from the electric motor (130) and gas introduction means (170) for introducing at least substantially dry motor protection gas into the first housing portion (142), characterised by:

restricted gas flow means (154) for permitting a leakage of the motor protection gas from the first housing portion (142) into the second housing portion (144); and

circulating apparatus (170) for diverting a portion of the fluid acted upon by the rotating machinery (132) to the first housing portion (142), the circulating apparatus including drying means (174) for reducing the moisture content of the acted upon gas diverted back to the first housing portion (142).

2. The assembly as claimed in claim 1, wherein the gas introduction means (148) includes external means for supplying the at least substantially dry gas (152).

3. The assembly as claimed in claim 2, wherein the means for supplying the at least substantially dry gas comprises a gas drying and supply unit on a remote host facility linked to the first housing portion by an umbilical (148).

4. The assembly as claimed in claim 1, 2 or 3, wherein the drying means (174) separates the diverted portion of the acted upon gas into an at least substantially moisture-free first outlet flow (176) and the circulating apparatus includes first routing means (182) for routing the first outlet flow from a first outlet (178) of the drying means (174) to the housing first portion (142).

5. The assembly as claimed in any preceding claim, wherein the drying means (174) incorporates moisture extracted from the acted upon gas into a second outlet flow (186) from the drying means (174).
- 5 6. The assembly as claimed in claim 5, wherein the second outlet flow (186) from the drying means (174) is transported away from the assembly by means of the gas being acted upon by the rotating machinery (132).
- 10 7. The assembly as claimed in claim 5 or 6, including second routing means (190,193) for routing the second outlet flow (186) containing the extracted moisture from a second outlet (188) of the drying means (174) and for incorporating it into the flow of gas acted upon by the rotating machinery (132).
- 15 8. The assembly as claimed in claim 7, wherein the second routing means (190) incorporates the second outlet flow (186) containing the extracted moisture into the acted upon gas at least substantially prior to it being acted upon by the rotating machinery (132).
- 20 9. The assembly as claimed in claim 7, wherein the second routing means (193) incorporates the second outlet flow (186) containing the extracted moisture into the acted upon gas at least substantially after it has been acted upon by the rotating machinery (132).
- 25 10. The assembly as claimed in claim 9, wherein the second routing means includes a pressure equalising device (196) for incorporating the second outlet flow (186) containing the extracted moisture into acted upon gas downstream of the rotating machinery (132).
- 30 11. The assembly as claimed in any preceding claim, wherein one or more gas outlet flows (176,186) from the drying means (174) pass through one or

more non-return valves (180,192,194) configured to prevent such flow or flows returning directly to said one or more outlets (178,188) of the drying means (174).

5 12. The assembly as claimed in any preceding claim, wherein the rotating machinery comprises a compressor (132) or a centrifugal pump.

13. The assembly as claimed in claim 12, wherein the second housing portion (144) includes a compressor inlet (158) for receiving gas at a first pressure and  
10 a compressor outlet (162) for delivering gas at a second pressure higher than the first pressure and the gas flow means (154) enables leakage of the motor protection gas into the second housing portion (144).

14. The assembly as claimed in claim 13, wherein the gas flow means (154)  
15 is adjacent the compressor inlet (158).

15. The assembly as claimed in any preceding claim, including means for automatically maintaining the motor protection gas at a pressure above that of fluid in a part of the second housing portion adjacent the gas flow means (154).

20 16. A method of operating an electric motor (130) accommodated in a first portion (142) of a housing (140) and arranged to drive a rotating machine (132) accommodated in a second portion (144) of the housing in which fluid in the second housing portion (144) which is acted upon by the rotating machine (132)  
25 is separated from the first housing portion (142) by separation means (146), the method including providing gas introduction means (170) for introducing at least substantially dry motor protection gas into the first housing portion (142), and providing restricted gas flow means (154) between the first and second housing portions (142,144), characterised by the steps of:

30 establishing a leakage of the motor protection gas from the first housing

portion (142) to the second housing portion (144) via the gas flow means (154);  
providing circulating apparatus (170) and diverting a portion of the acted  
upon gas to the first housing portion (142) via the circulating apparatus; and  
incorporating drying means (174) in the circulating apparatus (170) and  
5 reducing the moisture content of the acted upon gas diverted back to the first  
housing portion (142) by means of the drying means (174).